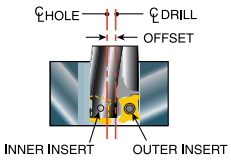
TECHNICAL / APPLICATION INFORMATION

WDS DRILL OFFSET

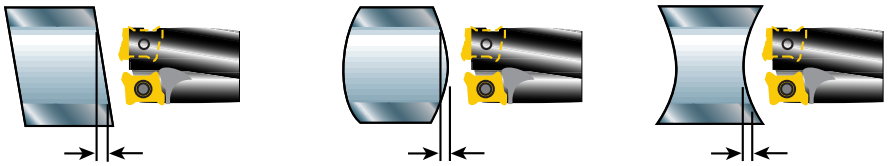
Maximum drill offset is recommended to be within three percent (3%) of drill diameter.



Example: Using a WDS079D3, a 3% offset will drill a 0.837″ hole diameter.
0.790″ x .03 = .0237″
.0237″ x 2 (for diameter) = .0474″
0.790″ (drill dia.) + 0.047″ = 0.837″

DRILLING INTO UNEVEN SURFACES

If the surface of the workpiece is not flat at the entrance and exit, you should reduce the feed rate in that area.
Drills under 1″ L/D = 3 reduce the feed by 30% L/D = 5 reduce the feed by 50%
Drills 1″ and over L/D = 3 reduce the feed by 40% L/D = 5 reduce the feed by 60%
L/D= Length to diameter ratio



*Once both inserts contact the workpiece you can increase your feed and drill at the recommended feed rate.

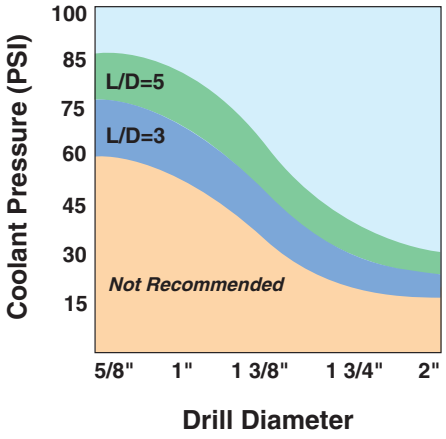
WDS CUTTING CONDITIONS

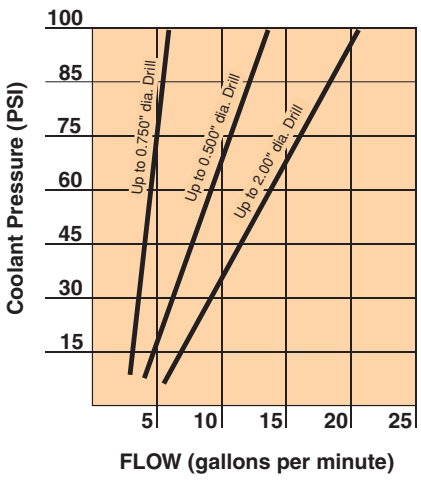
Work Material	Grade	SFM	Feed (ipr)*			
			<0.688 dia.	<0.938 dia.	<1.250 dia.	<2.000 dia.
Low Carbon Steel	ACZ310	350~600	.005~.009	.005~.010	.006~.011	.007~.012
Carbon Steel	ACZ310	330~590	.005~.011	.005~.012	.006~.014	.007~.015
Alloy Steel	AC350	320~500	.005~.010	.005~.011	.006~.012	.007~.013
Stainless Steel	AC350	300~500	.005~.008	.005~.009	.006~.010	.007~.011
Cast Iron (gray)	ACZ310	330~590	.005~.010	.005~.012	.006~.014	.007~.016
Aluminum	ACZ310	>1000	.005~.011	.005~.013	.006~.015	.007~.017

* Note: When using 5X L/D drills, reduce the feedrates to 80% and the feedrate at the entry point should be reduced to 50%.

WDS DRILL - COOLANT SUPPLY

It is important to provide an adequate supply of coolant at the recommended pressure and flow rate in order to ensure good chip removal. This chart shows the minimum coolant pressure and the recommended flow rate for the range of drill diameters.





TECHNICAL / APPLICATION INFORMATION

WDS HORSEPOWER CONSUMPTION

$$\frac{\text{IPR x Cf x DIA. x SFM}}{103} = \text{HP}$$

EXAMPLE:
Material: 303 Stainless Steel Bhn 160
Cf = 380
Drill Dia. = 0.750"
SFM = 400
IPR = .007

$$\frac{.007 \times 380 \times .750 \times 400}{103} = 7.7 \text{ HP}$$

WDS THRUST REQUIREMENTS

Drills over 1-3/16 dia.
IPR x Cf x DIA. x 350 = Lbs

Drills under 1-3/16 dia.
IPR x Cf x DIA. x 250 = Lbs

EXAMPLE:
Material: 303 Stainless Steel Bhn 160
Cf = 380
Drill Dia. = 0.750"
IPR = .007
.007 x 380 x .750 x 250 = 499 Lbs

* Note: To the answer add 20% to allow for error and different shop conditions. Do this for both HP & Thrust calculations

Material	Hardness Bhn	Cf cutting force factor
Low Carbon Steel	<200	240
Carbon Steel	<250	300
Low Alloy Steel	<250	320
	<400	360
High Alloy Steel	<400	370
	<520	500
Stainless Steel (300 series)	<270	380
Stainless Steel (400 series)	<270	370
Carbon Steel Castings	<225	250
Alloy Steel Castings	<225	280
Malleable	<160	210
	<300	230
Gray Cast Iron	<200	240
	<250	300
Ductile Cast Iron	<250	320
	<400	360
	<400	370
Aluminium	<150	100
Copper & Copper Based Alloys	<270	380
Nickel Based Alloys	<270	370
(Monel, Inconel, Hastelloy, Etc,)	<225	250
Cobalt Based Alloys	<225	280
	<160	210
Powdered Metals	<300	230

TT Tool Tip™

Always calculate horse power and thrust requirements before attempting a new application.